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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/803,106	03/18/2004	Jong Hyun Woo	LT-0059	5307
34610 7590 07/09/2008 KED & ASSOCIATES, LLP P.O. Box 221200 Chantilly, VA 20153-1200				
EXAMINER SIM, YONG H				
ART UNIT 2629		PAPER NUMBER		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/803,106

**Applicant(s)**

WOO, JONG HYUN

**Examiner**

YONG SIM

**Art Unit**

2629

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 31 March 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-5,9,11,13,14,18,21-23 and 32-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,9,11,13,14,18,21-23 and 32-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 5/1/2008.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 4/10/2008 have been fully considered but they are not persuasive.

At the outset, the Applicant is thanked for the thorough review and consideration of the Office Action dated 1/10/2008.

With respect to the Applicant's argument regarding claims 1, 11 and 21, the Applicant argues that the applied references do not teach or suggest deriving a PWM frequency of an inverter adapted to control a brightness of the LCD, wherein the deriving is based on the identified LCD refresh rate (recorded in an EDID of a memory provided in an LCD). Specifically, the Applicant argues that Nuimura does not teach or suggest the deriving a PWM frequency based on an identified LCD refresh rate.

However, Examiner respectfully disagrees since Nuimura clearly explains in Para 0027, "The CPU is operated in accordance with a program stored in the internal memory and produces the PWM signal Sc based on the frequency data Df generated by the display device (emphasis added. Also See para 0004; "display devices such as LCD.")... the CPU produces the PWM signal Sc by utilizing an internal programmed timer that is counted by clock signals for CPU... the CPU determines the frequency fc of the PWM signal Sc by inputting the

frequency of the vertical synchronization frequency  $f_v$  specified by Df." Df is derived from a vertical frequency of the display device which  $f_v$ . Examiner respectfully assert that a frame frequency, vertical frequency of a display device is synonymous with the refresh rate of the device. In Nuimura's case, the PWM frequency is derived based on an identified vertical frequency/refresh rate.

Therefore, the argument is moot and the previous rejections will be maintained.

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 33 recites the limitation "the average frame frequency" in line 3. There is insufficient antecedent basis for this limitation in the claim.

For the purpose of art rejection, "the average frame frequency will be construed as "an average frame frequency."

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**3. Claims 1, 3, 9, 11, 13 – 14, 21 – 22 and 32 – 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta et al. (US 2001/0004257 A1, hereinafter “Nitta”) in view of Nuimura (US 2004/0008176 A1).**

Re claim 1, Nitta teaches a method for identifying an LCD (Para 0006; “display apparatus such as liquid crystal display) frame frequency recorded in extended display identification data (EDID) of a memory provided in an LCD (Para 0011; “display has specification information already stored in its memory. This specification information is called EDID, and included, for example, frame rate.) to automatically make optimal settings for a proper display;

But Nitta does not specifically disclose a method for controlling an inverter pulse width modulation (PWM) frequency of a liquid crystal display (LCD) in a portable computer, comprising:

deriving a PWM frequency of an inverter adapted to control a brightness of the LCD, wherein the deriving is based on the identified LCD refresh rate; and

driving the LCD in accordance with the derived PWM frequency of the inverter for optimal display settings.

However, Nuimura teaches a method for controlling an inverter (inverter 4a) [Nuimura: Fig. 1] pulse width modulation (PWM) frequency of a liquid crystal display (LCD) [Nuimura: Para 0004; "display devices such as LCD used in notebook."] in a portable computer [Nuimura: Para 0027, lines 24 - 29; "the CPU determines the frequency  $f_c$  of the PWM signal  $S_c$  by inputting the frequency of the vertical synchronization frequency  $f_v$ /LCD refresh rate specified by frequency data  $D_f$ ."], comprising:

deriving a PWM frequency of an inverter adapted to control a brightness of the LCD, wherein the deriving is based on the identified LCD refresh rate [Nuimura: Para 0012, lines 4 - 8; "a duty ratio of a brightness control signal to be output to a lighting device by controlling a frequency of the brightness control signal in response to a vertical synchronization frequency." The vertical synchronization is equivalent to the frame frequency of 60Hz of NTSC system as described in line 9 of Para 0031.];

and driving the LCD in accordance with the derived PWM frequency of the inverter, [Nuimura: Para 0034, lines 1 - 5; "generates the driving signal  $S_d$  in response to the inputted PWM signal  $S_c$ , and the fluorescent lamp 4b is driven thereby."]

Therefore, taking the combined teachings of Nitta and Nuimura, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of controlling a PWM frequency of an inverter based on a vertical frequency /refresh rate as taught by Nuimura into the method of identifying an LCD display

information, including a frame frequency/vertical frequency, in an EDID to obtain a method wherein display information such as frame frequency/vertical frequency identified in an EDID is used to derive a PWM frequency of an inverter to correspondingly drive an LCD to avoid the display quality of a monitor by reducing the switching noise which is caused by incompatibility of a frame frequency/refresh rate and the display device (Nuimura: Para 0010).

Re claim 3, the combined teachings of Nitta and Nuimura teach the method of claim 1, wherein the memory is a non-volatile memory (Nitta discloses a method of storing EDID (extended Display Identification Data), which includes, the resolution, frequency of vertical scan signals, frame rate, vendor code and the serial number in the memory of a Plug-and-Play compatible display apparatus [Nitta: Para 001]. As described by Nitta, the EDID is stored in memory.

Although Nitta does not explicitly state that the memory is a non-volatile memory, it is obvious to a person having ordinary skill in the art to realize that EDIDs must be stored in a non-volatile memory to achieve its purpose of retaining the monitor information/identity including the vendor information or the serial number, thereby preventing the loss of the monitor information when the monitor is disconnected from its power source.

The limitations to claim 9 are substantially similar to the limitations of claim 1. Therefore, claim 9 has been analyzed and rejected substantially similar to claim 1. With

respect to the replacement LCD, Nitta teaches Plug-an-Play/replacement compatible displays wherein different displays output different EDID information for the displaying images properly according to the specifications (Nitta: Para 0013).

Re claim 11, Nitta teaches an LCD (Para 0006; "display apparatus such as liquid crystal display) frame frequency recorded in extended display identification data (EDID) of a memory provided in an LCD (Para 0011; "display has specification information already stored in its memory. This specification information is called EDID, and included, for example, frame rate.) to automatically make optimal settings for a proper display;

But Nitta does not specifically disclose an apparatus controlling an inverter pulse width modulation (PWM) frequency of a liquid crystal display (LCD) in a portable computer, comprising:

deriving a PWM frequency of an inverter adapted to control a brightness of the LCD responsive to the identified LCD refresh rate; and

driving the LCD in accordance with the derived PWM frequency of the inverter for optimal display settings.

However, Nuimura teaches an apparatus that controls an inverter (inverter 4a) [Nuimura: Fig. 1] pulse width modulation (PWM) frequency of a liquid crystal display (LCD) [Nuimura: Para 0004; "display devices such as LCD used in notebook."] in a portable computer [Nuimura: Para 0027, lines 24 - 29; "the CPU determines the frequency  $f_c$  of the PWM signal  $S_c$  by inputting the frequency of the vertical



Art Unit: 2629

synchronization frequency  $f_v$ /LCD refresh rate specified by frequency data  $D_f$ ."], comprising:

deriving a PWM frequency of an inverter adapted to control a brightness of the LCD responsive to the identified LCD frame frequency /refresh rate [Nuimura: Para 0012, lines 4 - 8; "a duty ratio of a brightness control signal to be output to a lighting device by controlling a frequency of the brightness control signal in response to a vertical synchronization frequency." The vertical synchronization is equivalent to the frame frequency of 60Hz of NTSC system as described in line 9 of Para 0031.];

and driving/controlling the LCD in accordance with the derived PWM frequency of the inverter, [Nuimura: Para 0034, lines 1 – 5; "generates the driving signal  $S_d$  in response to the inputted PWM signal  $S_c$ , and the fluorescent lamp 4b is driven thereby."]

Therefore, taking the combined teachings of Nitta and Nuimura, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of controlling a PWM frequency of an inverter based on a frame frequency/refresh rate as taught by Nuimura into the apparatus of identifying an LCD display information, including a frame frequency, in an EDID to obtain an apparatus wherein display information such as frame frequency/refresh rate identified in an EDID is used to derive a PWM frequency of an inverter to correspondingly drive an LCD to avoid the display quality of a monitor by reducing the switching noise which is caused by incompatibility of a frame frequency and the display device (Nuimura: Para 0010).

Re claim 13, Nitta wherein the memory includes identification data for a plurality of LCDs (Nitta discloses method of storing EDID (extended Display Identification Data), which includes, the resolution, frequency of vertical scan signals, frame rate, vender code and the serial number in the memory of a Plug-and-Play compatible display apparatus where the information varies with models of display apparatus [Nitta: Para 0011]. The different models/(plurality) hold different information in its own memory. Therefore the identification data for each LCD is stored in its memory.

Re claim 14, the combined teachings of Nuimura and Nitta teach that the control means sets the PWM frequency of the inverter to a frequency that does not substantially interfere with the vertical sync frequency (Nuimura teaches that a frequency of the brightness control signal/(PWM frequency of the inverter) is controlled by a control unit in response to a vertical synchronization frequency/(avoids synchronization/interference; see [Nuimura: Para 0010, lines 4 – 10]) in order to avoid switching noise [Nuimura: Para 0012, lines 4 – 8]).

The limitations of claim 21 are substantially similar to the limitations of 11. Therefore, it has been analyzed and rejected similar to the rejection of claim 11. With respect to the processor, Nuimura teaches a CPU/processor coupled to the display (See fig. 1. 3c contains a CPU and is coupled to a display device 2).

Re claim 22, Nuimura discloses wherein the display is rotatably coupled to the base module (See Para 0004, for the reference to the notebook computer.). It is inherent a notebook computers as described by Nuimura has the configuration such as the display being rotatably being coupled to the base in such a manner to mimic the configuration of a "notebook." Such as rotating the display for closing and opening the computer.

Re claim 32, the modified teachings of Nitta teach the portable computer of claim 21.

But Nitta does not expressly describe wherein the memory stores a plurality of PWM frequencies.

However, Nuimura teaches a plurality of PWM frequencies stored in advance in memory (Para 0039).

Therefore, taking the combined teachings of Nitta and Nuimura, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of having a plurality of PWM frequencies as taught by Nuimura into the modified teachings of Nitta to obtain a portable computer wherein a plurality of PWM frequencies are store in memory to give a user multiple options for optimal PWM signals for variety of vertical synchronization signals (Nuimura: Para 0039).

Re claim 33, the modified teachings of Nitta teach determining PWM frequencies based on a selected LCD frame frequency (See rejection of claim 1).

But Nitta does not expressly teach wherein the controller selects one of the plurality PWM frequencies based on a selected LCD frame frequency that corresponds to an average frame frequency.

However, Nuimura teaches wherein a control program selects one of the PWM signal in response to the vertical synchronization frequency of the inputted image signal (Nuimura: See Para 0040).

Therefore, taking the combined teachings of Nitta and Nuimura, as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the idea of selecting a PWM signal based on a frame frequency as taught by Nuimura into the modified teachings of Nitta to obtain a portable computer wherein a plurality of PWM frequencies selected based on a selected LCD frame frequency that corresponds to the average frame frequency to give a user multiple options for optimal PWM signals for variety of vertical synchronization signals (Nuimura: Para 0039).

The limitations of claim 34 are substantially similar to the limitations of 32. Therefore, it has been analyzed and rejected similar to the rejection of claim 32.

The limitations of claim 35 are substantially similar to the limitations of 33. Therefore, it has been analyzed and rejected similar to the rejection of claim 33.

The limitations of claim 36 are substantially similar to the limitations of 32. Therefore, it has been analyzed and rejected similar to the rejection of claim 32.

The limitations of claim 37 and 38 are substantially similar to the limitations of 33. Therefore, it has been analyzed and rejected similar to the rejection of claim 33.

**4. Claim 4 – 5, 18 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nitta in view of Nuimura as applied to claims 1, 3, 9, 11, 13 – 14, 21 – 22 and 32 – 38 above, and further in view of Wada et al. (US 5,977,934, herein after “Wada”).**

Re claim 4, Nitta and Nuimura as a whole teach the method of claim 1.

But fail to disclose the portable computer that is configured to receive a plurality of LCDs, wherein at least two of the LCDs have different frame frequencies.

However, Wada teaches the method of configuring an information processing apparatus to receive a plurality of LCDs (“TFT LCD” 2, “STN LCD” 9) [Wada: Fig. 2, Col. 2 lines 33 - 45], wherein the LCDs have different frame frequencies [Wada: Fig. 9C shows a FP, Frame Pulse/Frame frequency, that determines the beginning and the end of one screen in TFT LCD [Col. 5, lines 33 – 37], and Fig. 12C shows a FP of an STN LCD. The figures show that the lengths of the FPs are different from each other, therefore the frame frequencies are different.]

Therefore, taking the combined teachings of Nuimura and Nitta and Wada as a whole, it would have been obvious to a person having ordinary skill in the art to incorporate the method of receiving plurality of LCDs of as taught by Wada to the

Art Unit: 2629

method claim 1 as taught by Nuimura and Nitta to obtain a method of receiving plurality of LCDs with different frequencies so that any one of a plurality of types of display devices can be connected to a common information processing apparatus main unit.

[Wada: Col. 2, lines 25 – 28]

Re claim 5, Nuimura, Nitta and Wada as a whole teach the method of claim 4.

But does not teach that the plurality of LCDs is made by different vendors.

However, the STN LCD and TFT LCD as disclosed by Wada, would differ not only in quality, but also in the manufacturing process. [Col 1, lines 56 – 67].

Therefore, it would have been obvious to a person having ordinary skill in the art to include the use of LCDs of different types provided by different vendors to accommodate accessibility and availability of a user.

The limitations of claim 18 are substantially similar to the limitations of 4. Therefore, it has been analyzed and rejected similar to the rejection of claim 4 (Nuimura's LCD includes lamps).

The limitations of claim 23 are substantially similar to the limitations of claim 18. Therefore, it has been analyzed and rejected similar to the rejection of claim 18.

***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YONG SIM whose telephone number is (571)270-1189. The examiner can normally be reached on Monday - Friday (Alternate Fridays off) 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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6/30/2008